

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: LIN ET AL.

Application No. 10/733,016

Confirmation No. 7499

Filed: December 10, 2003

Group Art Unit: 2168

Examiner: LE, Debbie M

For: MAINTAINING AND DISTRIBUTING RELEVANT ROUTING INFORMATION BASE UPDATES TO  
SUBSCRIBING CLIENTS IN A DEVICE

**APPEAL BRIEF**

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

On June 4, 2008, Appellant appealed from the final Office action mailed February 6, 2008. Appellant submits this Appeal Brief with the fee for submitting this Appeal Brief being provided via EFS-Web. Appellant has further submitted a petition for an extension of time. Appellant further authorizes the Commissioner to charge Deposit Account No. 501430 with any additional fees due in connection with the submission of this paper, and petitions for any additional extension of time which may be deemed necessary.

Moreover, all pending claims are supported by the originally filed disclosure, recite patentable subject matter, and the prior art of record neither teaches nor suggests all the elements/limitations of any pending claim. Therefore, all pending claims are believed to be allowable, and the application is considered in good and proper form for allowance. Appellant respectfully requests all claim rejections be reversed and all claims be allowed. Additionally, Appellant requests the Office withdraw all rejections and/or objections and allow the case in response to this reply to the final Office action.

**(i) REAL PARTY IN INTEREST**

The above-identified application has been assigned to Cisco Technology, Inc. (a subsidiary of Cisco Systems, Inc.) by the inventors Minjie Lin, Rayen Mohanty, Lorenzo Vicisano, and Paul Arthur Jensen with this assignment recorded in the USPTO at Reel 014807, Frame 0011, with a recordation date of December 10, 2003.

**(ii) RELATED APPEALS AND INTERFERENCES**

NONE.

**(iii) STATUS OF CLAIMS**

Claims 1-23 are pending in the application.

No claims stand as canceled.

No claims stand as objected to.

All pending claims, claims 1-23, stand as rejected.

All pending claims, claims 1-23, are on appeal.

**(iv) STATUS OF AMENDMENT**

NONE.

**(v) SUMMARY OF CLAIMED SUBJECT MATTER**

There are eight independent claims on appeal, claims 1, 9, 14, 16, 17, 18, 20 and 22, related to maintaining and distributing relevant routing information base updates to subscribing clients within a device (e.g., router). There are many embodiments described in the extensive specification and illustrated in the large number of figures, and only one or some of these embodiments is/are described herein in relation to each independent claim on appeal as required by the Rules. Note, a reasonable overview of some of the extensible number of embodiments is described at least from page 10, line 8 to page 14, line 6 of the original disclosure. Additionally, Appellants further note that FIGs. 2, 4A, 4B, and 4C were updated in Amendment C filed March 21, 2007, to explicitly illustrate that the client is part of the router/device illustrated in these figures.

Turning to the independent claims, independent claim 1 is a method claim reciting patentably distinct limitations which are performed by a router (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) for distributing routing information within the router. One embodiment is described in relation to FIGs. 5A and 5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. Note, the claim preamble gives life to the claim limitation of "a router" when properly construed, especially as it provides antecedent basis for the element "the router" recited within the body of the claim. The method claim recites limitations, including: receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest (502 of FIG. 5A); maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest (504-518, especially 506-508, of FIG. 5A); receiving a particular route update (562 of FIG. 5C); and notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest (564-578, especially 572, of FIG. 5C); wherein the client is within the router (client 200 within device/router of FIG. 2).

Independent claim 9 is a method claim reciting patentably distinct limitations which are performed by a device (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) for distributing routing information within the device. One embodiment is described in relation to FIGs. 5A and 5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. Note, the claim preamble gives life to the claim limitation of "a device" when properly construed, especially as it provides antecedent basis for the element "the device" recited within the body of the claim. The method claim recites limitations, including: receiving a first set of addresses from a first client indicating route updates of interest to the first client and a first set of types of routing changes that are of interest to the first client (502 of FIG. 5A); receiving a second set of addresses from a second client indicating route updates of interest to the second client and a second set of types of routing changes that are of interest to the second client (502 of FIG. 5A); maintaining one or more data structures including information corresponding to the first and the second sets of addresses and the first and the second sets of types of routing changes that are of interest (504-518, especially 506-508, of FIG. 5A); receiving a particular route update (562 of FIG. 5C); performing one or more lookup operations on said one or more data structures to identify a result corresponding to the particular route update, the result identifying the first client but not the second client, and the particular route update corresponding to a particular type of routing change identified in the first set of types of routing changes that are of interest (564, 570, 574, 576, 578 of FIG. 5C); and notifying the first client but not the second client of the particular route update in response to the result identifying the first client but not the second client and the particular route update corresponds to a particular type of routing change identified in the first set of types of routing changes that are of interest (570, 572 of FIG. 5C); wherein the first client and the second client are within the device (client 200 within device/router of FIG. 2).

Independent claim 14 is a method claim reciting patentably distinct limitations which are performed by a device (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) for distributing routing information within a device. One embodiment is described in relation to FIGs. 5A and

5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. Note, the claim preamble gives life to the claim limitation of "a device" when properly construed, especially as it provides antecedent basis for the element "the device" recited within the body of the claim. The method claim recites limitations, including: maintaining a data structure of route dependencies including routes of interest to one or more clients (FIG. 5A); receiving a routing update identifying a particular route (562 of FIG. 5C); identifying that no client of said one or more clients has subscribed to receive an update corresponding to the particular route (570 of FIG. 5C); identifying a second particular route dependent on the particular route (574, 578 of FIG. 5C); identifying a particular client of said one or more clients has subscribed to receive an update corresponding to the second particular route (570 of FIG. 5C); and notifying the particular client of the update to the particular route in response to said identifying the particular client has subscribed to receive an update corresponding to the second particular route (572 of FIG. 5C); wherein said one or more clients are within the device (client 200 within device/router of FIG. 2).

Independent claim 16 is an apparatus claim written in means plus function format, reciting an apparatus for distributing routing information within a device (e.g., FIG. 2, also embodiments according to FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C). One embodiment is described in relation to FIGs. 2, 5A and 5C which are described at least from page 14, line 17 to page 15, line 23, page 19, lines 7-22, and from page 20, lines 8-24, of the original disclosure. The apparatus claim recites limitations, including: means for receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest (registration of address/route changes of interest 203 of FIG. 2, page 15, lines 1-7); means for maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest (relevant route update mechanism 210 of FIG. 2, page 14, line 17 to page 15, line 23); means for receiving a particular route update (route updates 223, route queries and results 222 of FIG. 2, page 14, lines 24-27); and means for notifying the client of the particular route update

in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest (relevant route updates 213 of FIG. 2, page 15, lines 12-19; also, one embodiment is configured to operate according to FIG. 5C, page 20, lines 8-24); wherein the client is within the apparatus (client 200 within device/router of FIG. 2).

Independent claim 17 is an apparatus claim, reciting a device (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) comprising one or more processors and a memory (301, 302 of FIG. 3), wherein the memory stores one or more instructions that, when executed by said one or more processors, perform operations. One embodiment is described in relation to FIGs. 5A and 5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. One embodiment performs the operations of: receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest (502 of FIG. 5A); maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest (504-518, especially 506-508, of FIG. 5A); receiving a particular route update (562 of FIG. 5C); and notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest (564-578, especially 572, of FIG. 5C); wherein the client is within the device (client 200 within device/router of FIG. 2).

Independent claim 18 is a method claim reciting patentably distinct limitations which are performed by a router (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) for distributing routing information within the router. One embodiment is described in relation to FIGs. 5A and 5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. Note, the claim preamble gives life to the claim limitation of "a router" when properly construed, especially as it provides antecedent basis for the element "the router" recited within the body of the claim. The method claim recites limitations, including:

receiving a set of addresses from a client indicating route updates of interest to the client (502 of FIG. 5A); identifying at least one dependent route on which an address in the set of addresses is dependent (510 of FIG. 5A); maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route (504-518, especially 510-518 and process block 516, of FIG. 5A); receiving a particular route update corresponding to a particular route of said at least one dependent route (562 of FIG. 5C); and notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route (564-578, especially 574, 578, and 572, of FIG. 5C); wherein the client is within the router (client 200 within device/router of FIG. 2).

Independent claim 20 is an apparatus claim, reciting a device (e.g., FIG. 2, FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C) comprising one or more processors and a memory (301, 302 of FIG. 3), wherein the memory stores one or more instructions that, when executed by said one or more processors, perform operations. One embodiment is described in relation to FIGs. 5A and 5C which are described at least from page 19, lines 7-22 and from page 20, lines 8-24, of the original disclosure. Note, the claim preamble gives life to the claim limitation of "a router" when properly construed, especially as it provides antecedent basis for the element "the router" recited within the body of the claim. The method claim recites limitations, including: receiving a set of addresses from a client indicating route updates of interest to the client (502 of FIG. 5A); identifying at least one dependent route on which an address in the set of addresses is dependent (510 of FIG. 5A); maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route (504-518, especially 510-518 and process block 516, of FIG. 5A); receiving a particular route update corresponding to a particular route of said at least one dependent route (562 of FIG. 5C); and notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route

(564-578, especially 574, 578, and 572, of FIG. 5C); wherein the client is within the router (client 200 within device/router of FIG. 2).

Independent claim 22 is an apparatus claim written in means plus function format, reciting an apparatus for distributing routing information within a device (e.g., FIG. 2, also embodiments according to FIG. 3, FIG. 4A, FIG. 4B, FIG. 4C). One embodiment is described in relation to FIGs. 2, 5A and 5C which are described at least from page 14, line 17 to page 15, line 23, page 19, lines 7-22, and from page 20, lines 8-24, of the original disclosure. The apparatus claim recites limitations, including: means for receiving a set of addresses from a client indicating route updates of interest to the client (registration of address/route changes of interest 203 of FIG. 2, page 15, lines 1-7); identifying at least one dependent route on which an address in the set of addresses is dependent (relevant route update mechanism 210 of FIG. 2, page 14, line 17 to page 15, line 23; including one embodiment configured to operate according to process block 510 of FIG. 5A); means for maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route (relevant route update mechanism 210 of FIG. 2, page 14, line 17 to page 15, line 23; including one embodiment configured to operate according to process blocks 504-518, especially process blocks 510-518 and process block 516, of FIG. 5A); means for receiving a particular route update corresponding to a particular route of said at least one dependent route (route updates 223, route queries and results 222 of FIG. 2, page 14, lines 24-27; including one embodiment configured to operate according to process block 562 of FIG. 5C); and means for notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route (relevant route updates 213 of FIG. 2, page 15, lines 12-19; also, one embodiment is configured to operate according to FIG. 5C, page 20, lines 8-24, including process blocks 564-578, especially process blocks 574, 578, and 572, of FIG. 5C); wherein the client is within the router (client 200 within device/router of FIG. 2).



**(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The issues presented on appeal are listed below, and then addressed in corresponding subheadings hereinafter. Although there are additional reasons that all claims are patentably distinct over the prior art of record, Appellants have elected solely for the purposes of this Appeal Brief to limit the issues to the issues listed below and discussed *infra*. Appellants respectfully request the Board reverse all rejection/objections.

Whether all pending claims, 1-23, are unpatentable under 35 USC § 103(a) over Butehorn et al., US Patent Application Publication 2004/0132451 A1 in view of Basturk et al., US Patent No. 6,938,095 B2.

**(vii) ARGUMENT**

**Whether all pending claims, 1-23, are unpatentable under 35 USC § 103(a) over Butehorn et al., US Patent Application Publication 2004/0132451 A1 in view of Basturk et al., US Patent No. 6,938,095 B2.**

**Group: claim 1-23**

**Representative: Independent claim 1**

The Office action fails to establish a *prima facie* rejection of any of claims 1-23 as the Office fails to articulate a rational reason for the combination of references; and therefore, the rejection is in contravention of *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (S. Ct. 2007). Additionally, the combination presented by the Office would render the primary reference unfit for its intended purpose in contravention of *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). It is well-established law that the burden is on the Office to initially present a *prima facie* unpatentability rejection, before Applicant has any burden of proof of disproving any application of a cited reference against a claim. *In re Warner*, 379 F2d. 1011, 1016, 154 USPA 173, 177 (C.C.P.A. 1967); *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (B.P.A.I. 1986).

As a threshold matter, the combination of references presented by the Office is improper for at least the reason that the Office's proposed combination is *non sequitur* to the articulated reason for combination. The Office rejects all claims under the combination of Butehorn et al. modified by Basturk et al. Final Office action mailed February 6, 2008, pages 3-11. The Office relies on Butehorn et al. for rejecting all claim elements with the sole exception that all claims require all limitations to be included in, or a part of a single device. *Id.*

Appellants agree with the Office that Butehorn et al. fails to teach distributing routing information within a router or device, with the client being in the router or device. *See, Id.* at 4, 7. Butehorn et al. teaches distributing routing information in a network. It teaches a route server collects routes from the terminals with the radio network, and then disseminates the collected

routes to the terminals for updating their respective route tables, with this approach having particular applicability to a fully meshed satellite network. Butehorn et al., Abstract.

The Office relies on Basturk et al. for teaching distributing routing information within a router, with the client being within the router/device because "it would enable reduction of outbound packet buffering and would allow for the frequency of updates (i.e., entries in a routing table) to adjust the speed at which they can be processed on the receiver end, as suggested by Basturk (col., 3, lines 58-61)." *Id.* at 4 (repeated at pp. 7-8). Let's look to see what Basturk et al. is really teaching here. The entire paragraph is reproduced immediately below.

"What is clearly needed is a method and apparatus that provides a virtual buffer for buffering one set of NLRIs that can be processed simultaneously by all of the peers. A method and apparatus such as this would enable reduction of outbound packet buffering and would allow for the frequency of updates to adjust to the speed at which they can be processed on the receiver end."

Basturk et al., col. 3, lines 56-62. In other words, the Office relies on the need for a virtual buffer to modify the network of Butehorn et al. (with a route server and terminals distributed across a diverse region and communicatively coupled via a satellite network) to a single device including the route server and terminals.

With all due respect, this articulated reason is *non sequitur* for the Office's proposed modification of Butehorn et al. First, this teaching is directed at how to send NLRIs (network-layer-routing-information) between different routers. Butehorn et al. uses the term "peer" to refer to a peer router – i.e., a different device. *Id.* at Title, Abstract, Background of the Invention (e.g., col. 2, line 27). Let's provide further context of this teaching relied upon by the Office, with several preceding paragraphs reproduced below.

"In a current process known to the inventors, all NLRIs from a routing table that are marked changed or deleted are queued and reviewed. If valid they are **converted into outbound data packets and buffered for transmission to peers on a per-peer basis** according to a timed advertising interval unique to each peer.

The advertising interval is the minimum allowable time period per peer that can expire before a next update of a same prefix or NLRI.

**A problem with the way the art is currently practiced is that BGP places every NLRI into outbound packet buffers on a per-peer basis. This means that significant packet buffering circuitry must be provided at the transmit or server side of the transactions. Change notifications are copied multiple times for multiple peers.** Moreover peers are forced to accept packets only as fast as the BGP module can create (replicate) and send them. In the event of a busy peer, no inbound data can be processed, which may lead to packet overflow at the outbound packet buffer of that the router on the sender side. The current (and inefficient) way to handle this problem is to slow every peer down in a peer group to the rate of the slowest peer.

Another problem with the way the art is currently practiced is that there is no priority scheme available. For example, a NLRI marked deleted should logically have a higher priority than one marked changed, as it is important to remove non-usable entries from all peers promptly.

**What is clearly needed is a method and apparatus that provides a virtual buffer for buffering one set of NLRIs that can be processed simultaneously by all of the peers. A method and apparatus such as this would enable reduction of outbound packet buffering and would allow for the frequency of updates to adjust to the speed at which they can be processed on the receiver end."**

Basturk et al., col. 3, lines 29-62 (**emphasis added**).

In other words, the Office, in rejecting all pending claims, relies on the need for a virtual buffer to modify the network of Butehorn et al. with a route server and terminals distributed across a diverse region and communicatively coupled via a satellite network, to a single device including the route server and terminals. Again, the relied upon teaching of Basturk et al. is *non*

*sequitur* to this proposed modification. The virtual buffer allows for a single NLRI to be sent to each of the peer routers without using multiple copies of the NLRI – i.e., one placed in each queue corresponding to a different peer router. Basturk et al. discusses this, including in the two paragraphs reproduced below.

"In another aspect of the invention, in a data router, a virtual output queue system for propagating route change notifications to individual ones of a finite set of peer routers is provided, the system comprising a virtual output queue (VOQ), a facility for entering and deleting change notifications as event objects in the VOQ, and an access module for managing access to the queue on behalf of individual ones of the finite set of peer routers, the access module retrieving event objects from the queue and sending the event objects to the router for which access is made.

In preferred embodiments in this aspect the event objects are each associated with a first reference number indicating the number of peers currently accessing the event object, and, as each peer completes access the reference number is decremented, and when the reference number for an event object is zero, and the event object is at the head of the queue, indicating that all consumers have accessed the event object, that event object is removed from the queue. In some cases each event object comprises a reference to the next event object in the queue. In some other cases each event object comprises a reference to the next event to be processed by a peer processing a current event object. There may also be a second reference number associated with each event object, initially indicating the number of peers yet to access the event object, the number decremented as each peer accesses the event."

Basturk et al., col. 4, lines 25-50.

For at least these reasons, Appellants respectfully submit that the rationale presented for the modification of Butehorn et al. might support using a virtual buffer in Butehorn et al., but provides no insight or teaching for modification of Butehorn et al. (e.g., a single device/router

including clients distributing routing information within the device/router). For at least these reasons, the Office fails to articulate a reasoning with a rational underpinning to support the legal conclusion of obviousness, which is a fundamental requirement of a proper obviousness conclusion. *KSR* at 1396 (citing *In re Kahn*).

Additionally, Appellants respectfully submit that a modification of Butehorn et al. would render it unfit for its intended purpose of routing information over a radio/satellite network to diversely located route server and terminals in contradiction of *In re Gordon* [reversing the Board's decision as it relied upon a modification of the French apparatus (liquid strainer) in a manner rendering it unfit for its intended purpose of filter liquids]. Similarly, modifying the system of Butehorn et al. to be a single device including the route server and terminal interconnected by a network would render it unfit for communicating between terminals in diverse locations. Otherwise, if the Office maintains that the terminals are in diverse locations in its proposed resulting combination of a single device, Applicants further traverse the rejection as it fails to provide a combination enabled for one skilled in the art to build – as such a single device including diversely located terminals would have to be excessively huge to communicate between terminals (included in the single device) encompassing the global Internet. *See, Butehorn* at paragraph [0003].

For at least these reasons, the Office action fails to present a *prima facie* obviousness rejection of independent claim 1 ( nor of any of claims 1-23); and Appellants respectfully request the Board reverse the rejections of independent claim 1 (as well as the rejections of all pending claims 1-23).

**Group: claim 1-13 and 15-17**

**Representative: Independent claim 1**

The Office action fails to establish a *prima facie* rejection of claim 1, as the Office fails to present a rejection for each claim limitation so as to put Appellants on notice of the rejection.

It is well-established law that the burden is on the Office to initially present a *prima facie* unpatentability rejection, before Applicant has any burden of proof of disproving any application of a cited reference against a claim. *In re Warner*, 379 F2d. 1011, 1016, 154 USPA 173, 177 (C.C.P.A. 1967); *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (B.P.A.I. 1986).

In rejecting claim 1, the Office action fails to adequately address the three recitations in claim 1 of the limitation of the "set of types of routing changes that are of interest." Appellants respectfully submit that a proper claim construction, including a broad but reasonable construction in light of the specification, requires the types of routing changes to be just that – a set of types. The following excerpt might help better understand the claim limitation.

"This client information allows a client to specify to the relevant route update mechanism the types of routing changes that are of interest to the client. Examples of the possible client information include, but are not limited to directly connected nexthop IP address, interface to reach the nexthop, route matrix, route distance, and routing protocol which provides the route. Based on the routing attributes a client selects, relevant route update mechanism sets up the notification policy for this client. This allows clients to be notified not only based on changes to routes for addresses of which they are interested, but also only for changes in routing attributes for addresses of interest with these changes having corresponding specified or default type of routing change. This is an extensible policy based scheme, and thus a policy can be on a per client, per address, per client/per address, or on any other basis desired for the particular embodiment."

Original disclosure, page 12, lines 6-16.

Claim 1 recites the limitation of "receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest." Appellants respectfully submit that the proper claim construction of this limitation would be that the client provides both (1) a set of addresses indicating route updates of interest, and (2) a set of types of routing changes that are of interest. In other words, the client might request for address 10.0.0.1 or 10.0.\*.\*, notify the client of a route update that changes the directly connected next hop IP address (one of the types of routing changes) or that changes the route distance (another one of the types of routing changes). In this example, if the route information for 10.0.0.1 or 10.0.\*.\* is updated but produces another type of change, but does not produce the type of change requested by the client in response of which to be notified, the client is not notified. In contrast, Butehorn et al. teaches that the route server collects *all the updates and multicasts them to all the route clients*. Butehorn et al. at paragraph [0090]. Note, claim 1 recites other limitations that maintain a version of this information for searching (i.e., "maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest"); and for providing such notification in response to a route update that matches the types of routing changes that are of interest ( "notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest").

Butehorn et al. (relied upon by the Office for teaching this limitation) neither teaches nor suggests "a type of routing changes of interest" to the client; nor teaches nor suggests the discriminatory notification based thereon for routing changes. In fact, Butehorn et al. teaches that the route server collects *all the updates and multicasts them to all the route clients*. Butehorn et al. at paragraph [0090]. For at least these reasons, the Office action fails to present a proper rejection of the limitations of (1) a set of addresses indicating route updates of interest, and (2) a set of types of routing changes that are of interest. In Butehorn et al., clients do not tell the route server what addresses nor types are of interest to them for the server to determine and provide



relevant, requested changes to the client. Rather, clients provide their routing information to the route server, which it accumulates and sends to all clients, whether it is of interest to them or not.

For at least these reasons, the Office fails to present a *prima facie* rejection of claim 1. For at least these reasons, Appellants respectfully request the Board reverse the rejections of claims 1-13 and 15-17.

**Group: claim 14-15**

**Representative: Independent claim 14**

The Office action fails to establish a *prima facie* rejection of claim 14, as the Office fails to present a rejection for each claim limitation so as to put Appellants on notice of the rejection.

It is well-established law that the burden is on the Office to initially present a *prima facie* unpatentability rejection, before Applicant has any burden of proof of disproving any application of a cited reference against a claim. *In re Warner*, 379 F2d. 1011, 1016, 154 USPA 173, 177 (C.C.P.A. 1967); *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (B.P.A.I. 1986).

In rejecting claim 14, the Office action fails to adequately address the three recitations in claim 14 of the limitation of "subscribed." Appellants respectfully submit that a proper claim construction, including a broad but reasonable construction in light of the specification, requires that the client actually subscribe to receive such notification as expressly recited in the claim. Butehorn et al. (relied upon by the Office for teaching this limitation) neither teaches nor suggests such subscription by the client; nor teaches nor suggests the discriminatory notification based thereon for routing changes. In fact, Butehorn et al. teaches that the route server collects *all the updates and multicasts them to all the route clients*. Butehorn et al. at paragraph [0090]. In Butehorn et al., clients do not subscribe to route updates of interest for the server to determine and provide relevant, requested changes to the client. Rather, clients provide their routing information to the route server, which it accumulates and sends to all clients, whether a client has subscribed to the particular routing update or not.

For at least these reasons, the Office fails to present a *prima facie* rejection of claim 14. For at least these reasons, Appellants respectfully request the Board reverse the rejections of claims 14-15.

**Group: claim 18-23**

**Representative: Independent claim 18**

The Office action fails to establish a *prima facie* rejection of claim 18, as the Office fails to present a rejection for each claim limitation so as to put Appellants on notice of the rejection.

It is well-established law that the burden is on the Office to initially present a *prima facie* unpatentability rejection, before Applicant has any burden of proof of disproving any application of a cited reference against a claim. *In re Warner*, 379 F2d. 1011, 1016, 154 USPA 173, 177 (C.C.P.A. 1967); *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (B.P.A.I. 1986).

In rejecting claim 18 (as well as independent claims 20 and 22), the Office action relies on its rejection of claim 14. Final Office action at 10. However, claim 18 recites the limitations of "receiving a set of addresses from a client indicating route updates of interest to the client," which is not recited in claim 18, nor does the Office address this limitation in rejecting claim 18. For at least this reason, the Office has failed to present a *prima facie* rejection of claim 18; and Appellants respectfully request the Board reverse the rejections of claims 18-23.

Additionally, Butehorn et al. (relied upon by the Office for teaching all limitations except the clients being within the device) neither teaches nor suggests such subscription by the client of what route changes to discriminately notify the client as recited in claim 18. In fact, Butehorn et al. teaches that the route server collects *all the updates and multicasts them to all the route clients*. Butehorn et al. at paragraph [0090]. For at least these reasons, the Office action fails to present a proper rejection of the limitations of receiving a set of addresses from a client indicating route updates of interest to the client, nor the limitation of notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route. In Butehorn et al., clients do not tell the route server what addresses are of interest to them for the server to determine and provide relevant, requested changes to the client. Rather, clients provide their routing information to the route server, which it accumulates and sends to all clients, whether it is of interest to them or not.

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For at least these reasons, the Office fails to present a *prima facie* rejection of claim 18.  
For at least these reasons, Appellants respectfully request the Board reverse the rejections of  
claims 18-23.

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FINAL REMARKS. For at least the reasons presented herein, Appellants respectfully request all rejections be reversed, all claims be allowed, and the application be passed to issuance. Finally, all pending claims recite patentable subject matter, are supported by the originally filed disclosure, and the prior art of record neither teaches nor suggests all the elements/limitations of any pending claim. Therefore, all pending claims are believed to be allowable, and the application is considered in good and proper form for allowance. Appellants respectfully request all claim rejections be reversed and all claims be allowed. Additionally, Appellants request the Office withdraw all rejections and/or objections and allow the case in response to this reply to the final Office action.

Respectfully submitted,  
**The Law Office of Kirk D. Williams**

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**(viii) CLAIMS APPENDIX**

1. A method performed within a router for distributing routing information within the router, the method comprising:

receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest;

maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest;

receiving a particular route update; and

notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest;

wherein the client is within the router.

2. The method of claim 1, wherein said at least one routing attribute includes a change in an interface for reaching an address in the set of addresses.

3. The method of claim 2, wherein said notifying the client of the particular route update includes notifying the client of the address.

4. The method of claim 1, wherein said at least one routing attribute includes a change in a path from the router to an address in the set of addresses.

5. The method of claim 4, wherein the address is directly reachable from the router.

6. The method of claim 1, wherein said at least one routing attribute includes a change in whether an address in the set of addresses is directly reachable or is not directly reachable.

7. The method of claim 1, wherein said at least one routing attribute includes a change in a distance to reach an address in the set of addresses.

8. The method of claim 1, wherein said at least one routing attribute includes a change in a cost metric to reach an address in the set of addresses.

9. A method performed within a device for distributing routing information within the device, the method comprising:

receiving a first set of addresses from a first client indicating route updates of interest to the first client and a first set of types of routing changes that are of interest to the first client;

receiving a second set of addresses from a second client indicating route updates of interest to the second client and a second set of types of routing changes that are of interest to the second client;

maintaining one or more data structures including information corresponding to the first and the second sets of addresses and the first and the second sets of types of routing changes that are of interest;

receiving a particular route update;

performing one or more lookup operations on said one or more data structures to identify a result corresponding to the particular route update, the result identifying the first client but not the second client, and the particular route update corresponding to a particular type of routing change identified in the first set of types of routing changes that are of interest; and

notifying the first client but not the second client of the particular route update in response to the result identifying the first client but not the second client and the particular route update corresponds to a particular type of routing change identified in the first set of types of routing changes that are of interest;

wherein the first client and the second client are within the device.



10. The method of claim 9, wherein said one or more data structures maintains a single set of types of routing changes that are of interest to the first and the second clients based on the first and the second sets of types of routing changes that are of interest.

11. The method of claim 9, wherein said information maintained by said one or more data structures identifies different states of interest by clients, wherein said different states of interest include: whether the first client, the second client, both the first and second clients, and neither the first or second client are interested in a particular type of routing change.

12. The method of claim 11, wherein a single indication of said different states of interest by clients is maintained for all of the addresses in the first and second sets of addresses.

13. The method of claim 11, wherein an indication of said different states of interest by clients is maintained for each address of said first and second sets of addresses.

14. A method performed within a device for distributing routing information within the device, the method comprising:

maintaining a data structure of route dependencies including routes of interest to one or more clients;

receiving a routing update identifying a particular route;

identifying that no client of said one or more clients has subscribed to receive an update corresponding to the particular route;

identifying a second particular route dependent on the particular route;

identifying a particular client of said one or more clients has subscribed to receive an update corresponding to the second particular route; and

notifying the particular client of the update to the particular route in response to said identifying the particular client has subscribed to receive an update corresponding to the second particular route;

wherein said one or more clients are within the device.

15. The method of claim 14, comprising identifying a change corresponding to the second particular route matches a types of routing changes that are of interest to the particular client; and wherein said notify the particular client is performed in response to said identifying the particular client has subscribed to receive an update corresponding to the second particular route and said identifying the change corresponding to the second particular route matches a types of routing changes that are of interest to the particular client.

16. An apparatus for distributing routing information within a device, the apparatus comprising:

means for receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest;

means for maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest;

means for receiving a particular route update; and

means for notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest;

wherein the client is within the apparatus.

17. A device comprising one or more processors and a memory, wherein the memory stores one or more instructions that, when executed by said one or more processors, perform the operations of:

receiving a set of addresses from a client indicating route updates of interest to the client and a set of types of routing changes that are of interest;

maintaining one or more data structures including information corresponding to the set of addresses and the set of types of routing changes that are of interest;

receiving a particular route update; and

notifying the client of the particular route update in response to identifying the particular route update corresponds to both at least one address in the set of addresses and at least one routing attribute in the set of types of routing changes that are of interest;

wherein the client is within the device.

18. A method performed within a router for distributing routing information within the router, the method comprising:

receiving a set of addresses from a client indicating route updates of interest to the client;

identifying at least one dependent route on which an address in the set of addresses is dependent;

maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route;

receiving a particular route update corresponding to a particular route of said at least one dependent route; and

notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route;

wherein the client is within the router.

19. The method of claim 18, wherein said identifying the particular route update corresponds to the particular route of said at least one dependent route includes performing one or more lookup operations on said one or more data structures to identify one or more entries, wherein at least one of said one or more entries identifies that the client is interested in a change in said at least one dependent route.

20. A device comprising one or more processors and a memory, wherein the memory stores one or more instructions that, when executed by said one or more processors, perform the operations of:

receiving a set of addresses from a client indicating route updates of interest to the client;

identifying at least one dependent route on which an address in the set of addresses is dependent;

maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route;

receiving a particular route update corresponding to a particular route of said at least one dependent route; and

notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route;

wherein the client is within the device.

21. The device of claim 20, wherein said identifying the particular route update corresponds to the particular route of said at least one dependent route includes performing one or more lookup operations on said one or more data structures to identify one or more entries, wherein at least one of said one or more entries identifies that the client is interested in a change in said at least one dependent route.

22. An apparatus for distributing routing information within a device, the apparatus comprising:

means for receiving a set of addresses from a client indicating route updates of interest to the client;

means for identifying at least one dependent route on which an address in the set of addresses is dependent;

means for maintaining one or more data structures including information corresponding to the set of addresses and said at least one dependent route;

means for receiving a particular route update corresponding to a particular route of said at least one dependent route; and

means for notifying the client of the particular route update in response to identifying the particular route update corresponds to the particular route of said at least one dependent route;

wherein the client is within the apparatus.

23. The apparatus of claim 22, wherein said means for identifying the particular route update corresponds to the particular route of said at least one dependent route includes means for performing one or more lookup operations on said one or more data structures to identify one or more entries, wherein at least one of said one or more entries identifies that the client is interested in a change in said at least one dependent route.

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**(ix) EVIDENCE APPENDIX**

NONE.



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**(x) RELATED PROCEEDINGS APPENDIX**

NONE.